



SEQUENCE LISTING

<110> Biogen Idec Inc.
Anderson, Darrell R.
Rastetter, William H.
Hanna, Nabil
Leonard, John E.
Newman, Roland
Reff, Mitchell

<120> THERAPEUTIC APPLICATION OF CHIMERIC AND RADIOLABELED ANTIBODIES
TO HUMAN B LYMPHOCYTE RESTRICTED DIFFERENTIATION ANTIGEN FOR
TREATMENT OF B CELL LYMPHOMA

<130> 037003-0280646

<140> 09/911,692

<141> 2001-07-25

<160> 11

<170> PatentIn version 3.2

<210> 1

<211> 8540

<212> DNA

<213> Artificial

<220>

<223> vector

<400> 1

gacgtcgcg	ccgctctagg	cctccaaaa	agcctcctca	ctacttctgg	aatagctcag	60
aggccgaggc	ggcctcggcc	tctgcataaa	taaaaaaaaat	tagtcagcca	tgcatggggc	120
ggagaatggg	cggaactggg	cggagttagg	ggcgggatgg	gcgaggttag	gggcgggact	180
atggttgctg	actaattgag	atgcatgctt	tgcatacttc	tgcttgctgg	ggagcctggg	240
gactttccac	acctgggtgc	tgactaattg	agatgcatgc	tttgcatact	tctgcctgct	300
ggggagcctg	gggactttcc	acaccctaac	tgacacacat	tccacagaat	taattcccct	360
agttattaat	agtaatcaat	tacgggggtca	ttagttcata	gcccataat	ggagtccgc	420
gttacataac	ttacggtaaa	tggccgcct	ggctgaccgc	ccaacgaccc	ccgcccattg	480
acgtcaataa	tgacgtatgt	tcccatagta	acgccaatag	ggactttcca	ttgacgtcaa	540
tggttggtg	acttacggta	aactgcccac	ttggcagtac	atcaagtgtg	tcatatgcca	600
agtaagcccc	ctattgacgt	caatgacggt	aaatggcccc	cctggcatta	tgcccagtac	660
atgaccttat	gggactttcc	tacttggcag	tacatctacg	tattagtcac	cgctattacc	720
atggtgatgc	ggttttggca	gtacatcaat	gggcgtggat	agcgggttga	ctcacgggga	780

tttccaagtc tccaccccat tgacgtcaat gggagtttgt tttggcacca aaatcaacgg	840
gactttccaa aatgtcgtaa caactccgcc ccattgacgc aaatgggcgg taggcgtgta	900
cgggtgggagg tctatataag cagagctggg tacgtgaacc gtcagatcgc ctggagacgc	960
catcacagat ctctcaccat gagggtcccc gctcagctcc tggggctcct gctgctctgg	1020
ctcccagggtg cacgatgtga tggtagcaag gtggaaatca aacgtacggg ggctgcacca	1080
tctgtcttca tcttcccgcc atctgatgag cagttgaaat ctggaactgc ctctgtttgtg	1140
tgccctgctga ataacttcta tcccagagag gccaaagtac agtggaagggt ggataacgcc	1200
ctccaatcgg gtaactccca ggagagtgtc acagagcagg acagcaagga cagcacctac	1260
agcctcagca gcaccctgac gctgagcaaa gcagactacg agaaacacaa agtctacgcc	1320
tgccaagtca cccatcaggg cctgagctcg cccgtcacia agagcttcaa caggggagag	1380
tggtgaattc agatccgtta acggttacca actacctaga ctggattcgt gacaacatgc	1440
ggccgtgata tctacgtatg atcagcctcg actgtgcctt ctagttgcca gccatctgtt	1500
gtttgccccct cccccgtgcc ttccttgacc ctggaagggt ccaactccac tgtcctttcc	1560
taataaaatg aggaaattgc atcgcatgtt ctgagtaggt gtcattctat tctgggggggt	1620
gggggtggggc aggacagcaa gggggaggat tgggaagaca atagcaggca tgctggggat	1680
gcgggtgggct ctatggaacc agctggggct cgacagctat gccaaagtac cccctattg	1740
acgtcaatga cggtaaatgg cccgcctggc attatgcccc gtacatgacc ttatgggact	1800
ttcctacttg gcagtacatc tacgtattag tcatcgctat taccatgggt atgcgggtttt	1860
ggcagtacat caatgggcgt ggatagcggg ttgactcacg gggatttcca agtctccacc	1920
ccattgacgt caatgggagt ttgttttggc accaaaatca acgggacttt ccaaaatgtc	1980
gtaacaactc cgccccattg acgcaaattg gcggtaggcg tgtacgggtg gaggtctata	2040
taagcagagc tgggtacgtc ctcacattca gtgatcagca ctgaacacag acccgtcgac	2100
atggggttga gcctcatctt gctcttctct gtcgctgttg ctacgcgtgt cgctagcacc	2160
aagggcccat cggctcttccc cctggcacc cctccaaga gcacctctgg gggcacagcg	2220
gccttggggt gcctgtgtca ggactacttc cccgaaccgg tgacgggtgtc gtggaactca	2280
ggcgccctga ccagcggcgt gcacaccttc ccggctgtcc tacagtcctc aggactctac	2340
tccctcagca gcgtggtgac cgtgccctcc agcagcttgg gcaccacagac ctacatctgc	2400
aacgtgaatc acaagcccag caacaccaag gtggacaaga aagcagagcc caaatcttgt	2460
gacaaaactc acacatgccc accgtgcccc gcacctgaac tcctgggggg accgtcagtc	2520
ttcctcttcc ccccaaaacc caaggacacc ctcatgatct cccggacccc tgaggtcaca	2580

tgcggtggtgg tggacgtgag ccacgaagac cctgaggtca agttcaactg gtacgtggac	2640
ggcggtggagg tgcataatgc caagacaaag ccgcggggagg agcagtacaa cagcacgtac	2700
cgtgtggtca gcgtcctcac cgtcctgcac caggactggc tgaatggcaa ggactacaag	2760
tgcaaggtct ccaacaaagc cctcccagcc cccatcgaga aaaccatctc caaagccaaa	2820
gggcagcccc gagaaccaca ggtgtacacc ctgcccccat cccgggatga gctgaccagg	2880
aaccagggtca gcctgacctg cctgggtcaaa ggctttctatc ccagcgacat cgccgtggag	2940
tgggagagca atgggcagcc ggagaacaac tacaagacca cgctcccgt gctggactcc	3000
gacggtcctt tcttcctcta cagcaagctc accgtggaca agagcagggtg gcagcagggg	3060
aacgtcttct catgctccgt gatgcatgag gctctgcaca accactacac gcagaagagc	3120
ctctccctgt ctccgggtaa atgaggatcc gttaacgggtt accaactacc tagactggat	3180
tcgtgacaac atgcggccgt gatatctacg tatgatcagc ctcgactgtg ccttctagtt	3240
gccagccatc tgttggttgc cctcccccg tgccttcctt gaccctggaa ggtgccactc	3300
ccactgtcct ttcctaataa aatgaggaaa ttgcatcgca ttgtctgagt aggtgtcatt	3360
ctattctggg ggggtggggtg gggcaggaca gcaaggggga ggattgggaa gacaatagca	3420
ggcatgctgg ggatgcggtg ggctctatgg aaccagctgg ggctcgacag cgctggatct	3480
cccgatcccc agctttgctt ctcaatttct tatttgcata atgagaaaaa aaggaaaatt	3540
aattttaaca ccaattcagt agttgattga gcaaatgcgt tgccaaaaag gatgctttag	3600
agacagtgtt ctctgcacag ataaggacaa acattattca gagggagtac ccagagctga	3660
gactcctaag ccagtgagtg gcacagcatt ctagggagaa atatgcttgt catcaccgaa	3720
gcctgattcc gtagagccac accttggtaa gggccaatct gctcacacag gatagagagg	3780
gcaggagcca gggcagagca tataagggtga ggtaggatca gttgctcctc acatttgctt	3840
ctgacatagt tgtgttgga gcttgatag cttggacagc tcagggtgc gatttcgcgc	3900
caaacttgac ggcaatccta gcgtgaaggc tggtaggatt ttatccccgc tgccatcatg	3960
gttcgaccat tgaactgcat cgtcgccgtg tcccaaaata tggggattgg caagaacgga	4020
gacctaccct ggcctccgct caggaacgag ttcaagtact tccaaagaat gaccacaacc	4080
tcttcagtgg aaggtaaaca gaatctggtg attatgggta ggaaaacctg gttctccatt	4140
cctgagaaca atcgacctt aaaggacaga attaatatag ttctcagtag agaactcaaa	4200
gaaccaccac gaggagctca ttttcttgcc aaaagtttg atgatgcctt aagacttatt	4260
gaacaaccgg aattggcaag taaagtagac atggtttgga tagtcggagg cagttctgtt	4320
taccaggaag ccatgaatca accaggccac cttagactct ttgtgacaag gatcatgcag	4380

gaatttgaaa	gtgacacggt	tttcccagaa	attgattttgg	ggaaatataa	acttctccca	4440
gaataccag	gcgtcctctc	tgaggtccag	gaggaaaaag	gcatcaagta	taagtttgaa	4500
gtctacgaga	agaaagacta	acaggaagat	gctttcaagt	tctctgctcc	cctcctaaag	4560
tcatgcattt	ttataagacc	atgggacttt	tgctggcttt	agatcagcct	cgactgtgcc	4620
ttctagttgc	cagccatctg	ttgtttgccc	ctcccccggtg	ccttccttga	ccctggaagg	4680
tgccactccc	actgtccttt	cctaataaaa	tgaggaaatt	gcatcgcat	gtctgagtag	4740
gtgtcattct	attctggggg	gtggggtggg	gcaggacagc	aagggggagg	attgggaaga	4800
caatagcagg	catgctgggg	atgcggtggg	ctctatggaa	ccagctgggg	ctcgagctac	4860
tagctttgct	tctcaatttc	ttatttgcat	aatgagaaaa	aaaggaaaat	taattttaac	4920
accaattcag	tagttgattg	agcaaatgcg	ttgccaaaaa	ggatgcttta	gagacagtgt	4980
tctctgcaca	gataaggaca	aacattattc	agaggggagta	cccagagctg	agactcctaa	5040
gccagtgagt	ggcacagcat	tctagggaga	aatatgcttg	tcatcaccga	agcctgattc	5100
cgtagagcca	caccttggtg	agggccaatc	tgctcacaca	ggatagagag	ggcaggagcc	5160
agggcagagc	atataagggtg	aggtaggatc	agttgctcct	cacatttgct	tctgacatag	5220
ttgtgttggtg	agcttggtgc	gacctcttat	ggttgaacaa	gatggattgc	acgcaggttc	5280
tccggccgct	tgggtggaga	ggctattcgg	ctatgactgg	gcacaacaga	caatcggtcg	5340
ctctgatgcc	gccgtgttcc	ggctgtcagc	gcagggggcg	ccggttcttt	ttgtcaagac	5400
cgacctgtcc	ggtgccctga	atgaactgca	ggacgaggca	gcgcggctat	cgtggctggc	5460
cacgacgggc	gttccttgcg	cagctgtgct	cgacgttgct	actgaagcgg	gaagggactg	5520
gctgctattg	ggcgaagtgc	cggggcagga	tctcctgtca	tctcaccttg	ctcctgccga	5580
gaaagtatcc	atcatggctg	atgcaatgcg	gcggctgcat	acgcttgatc	cggctacctg	5640
cccattcgac	caccaagcga	aacatcgcat	cgagcgagca	cgtactcgga	tgaagccgg	5700
tcttgctgat	caggatgatc	tggacgaaga	gcatcagggg	ctcgcgccag	ccgaactgtt	5760
cgcaggctc	aaggcgcgca	tgcccgacgg	cgaggatctc	gtcgtgaccc	atggcgatgc	5820
ctgcttgccg	aatatcatgg	tggaaaatgg	ccgcttttct	ggattcatcg	actgtggccg	5880
gctgggtgtg	gcggaccgct	atcaggacat	agcgttggt	accogtgata	ttgctgaaga	5940
gcttggcggc	gaatgggctg	accgcttcct	cgtgctttac	ggtatcgccg	ctcccgattc	6000
gcagcgcate	gccttctatc	gccttcttga	cgagttcttc	tgagcgggac	tctggggttc	6060
gaaatgaccg	accaagcgac	gcccaacctg	ccatcacgag	atttcgattc	caccgccgcc	6120
ttctatgaaa	ggttgggctt	cggaatcggt	ttccgggacg	ccggctggat	gacctccag	6180

cgcggggatac tcatgctgga gttcttcgcc caccccaact tgtttattgc agcttataat 6240
ggttacaaat aaagcaatag catcacaaat ttcacaaata aagcattttt ttcactgcat 6300
tctagttgtg gtttgtccaa actcatcaat ctatcttatac atgtctggat cgcggccgcg 6360
atcccgtcga gagcttggcg taatcatggt catagctggt tcctgtgtga aattgttatac 6420
cgctcacaaat tccacacaac atacgagccg gaagcataaa gtgtaaagcc tggggtgcct 6480
aatgagttag ctaactcaca ttaattgcgt tgcgctcact gcccgctttc cagtcgggaa 6540
acctgtcgtg ccagctgcat taatgaatcg gccaacgcgc ggggagaggc ggtttgcgta 6600
ttgggcgctc ttccgcttcc tcgctcactg actcgctgcg ctcggtcggt cggctgcggc 6660
gagcggatc agctcactca aaggcggtaa tacggttatac cacagaatca ggggataacg 6720
caggaaagaa catgtgagca aaaggccagc aaaaggccag gaaccgtaaa aaggccgcgt 6780
tgctggcggt tttccatagg ctccgcccc ctgacgagca tcacaaaaat cgacgctcaa 6840
gtcagagggt gcgaaacccg acaggactat aaagatacca ggcgtttccc cctggaagct 6900
ccctcgtgcg ctctcctggt ccgacctgc cgcttaccgg atacctgtcc gcctttctcc 6960
cttcgggaag cgtggcgctt tctcaatgct cagctgtag gtatctcagt tcggtgtagg 7020
tcgttcgctc caagctgggc tgtgtgcacg aacccccgt tcagcccgac cgctgcgcct 7080
tatccggtaa ctatcgtctt gagtccaacc cggtaaagaca cgacttatcg ccactggcag 7140
cagccactgg taacaggatt agcagagcga ggtatgtagg cggtgctaca gagttcttga 7200
agtggtggcc taactacggc tacactagaa ggacagtatt tggatatctgc gctctgctga 7260
agccagttac cttcggaaaa agagttggta gctcttgatc cggcaaacia accaccgctg 7320
gtagcgggtg tttttttgtt tgcaagcagc agattacgcg cagaaaaaaaa ggatctcaag 7380
aagatccttt gatcttttct acgggggtctg acgctcagtg gaacgaaaac tcacgttaag 7440
ggattttggc catgagatta tcaaaaagga tcttcaccta gatcctttta aattaaaaat 7500
gaagttttta atcaatctaa agtatatatg agtaaaactg gtctgacagt taccaatgct 7560
taatcagtga ggcacctatc tcagcgatct gtctatttctg ttcattccata gttgcctgac 7620
tcccgcgtcgt gtagataact acgatacggg agggcttacc atctggcccc agtgctgcaa 7680
tgataccgcg agaccacgc tcaccggctc cagatttatac agcaataaac cagccagccg 7740
gaagggccga gcgcagaagt ggtcctgcaa ctttatccgc ctccatccag tctattaatt 7800
gttgccggga agctagagta agtagttcgc cagttaatag tttgcgcaac gttgttgcca 7860
ttgctacagg catcgtggtg tcacgctcgt cgtttggtat ggcttcattc agctccggtt 7920
cccaacgatac aaggcgagtt acatgatccc ccatgttggtg caaaaaagcg gttagctcct 7980

tcggtcctcc gatcgttgtc agaagtaagt tggccgcagt gttatcactc atggttatgg 8040
cagcactgca taattctctt actgtcatgc catccgtaag atgcttttct gtgactgggtg 8100
agtactcaac caagtcattc tgagaatagt gtatgcggcg accgagttgc tcttgcccgg 8160
cgtcaatacg ggataatacc gcgccacata gcagaacttt aaaagtgtc atcattggaa 8220
aacgttcttc ggggcgaaaa ctctcaagga tcttaccgct gttgagatcc agttcgatgt 8280
aaccactcg tgcacccaac tgatcttcag catcttttac tttcaccagc gtttctgggt 8340
gagcaaaaac aggaaggcaa aatgccgcaa aaaagggaaat aagggcgaca cggaaatgtt 8400
gaatactcat actcttcctt tttcaatatt attgaagcat ttatcagggt tattgtctca 8460
tgagcggata catatttgaa tgtatttaga aaaataaaca aataggggtt ccgcgcacat 8520
ttccccgaaa agtgccacct 8540

<210> 2
<211> 9209
<212> DNA
<213> Artificial

<220>
<223> vector with chimeric antibody sequence

<400> 2

gacgtcgcgg ccgctctagg cctccaaaaa agcctcctca ctacttctgg aatagctcag 60
aggccgaggc ggccctcggc tctgcataaa taaaaaaaat tagtcagcca tgcattggggc 120
ggagaatggg cggaactggg cggagttagg ggcgggatgg gcggagttag gggcgggact 180
atggttgctg actaattgag atgcatgctt tgcatacttc tgcctgctgg ggagcctggg 240
gactttccac acctgggtgc tgactaattg agatgcatgc tttgcatact tctgcctgct 300
ggggagcctg gggactttcc acaccctaac tgacacacat tccacagaat taattcccct 360
agttattaat agtaatcaat tacgggggtca ttagttcata gcccatatat ggagttccgc 420
gttacataac ttacggtaaa tggcccgctt ggctgaccgc ccaacgaccc ccgcccattg 480
acgtcaataa tgacgtatgt tcccatagta acgccaatag ggactttcca ttgacgtcaa 540
tggttggtgact atttacggta aactgcccac ttggcagtag atcaagtgt tcatatgcc 600
agtacgcccc ctattgacgt caatgacggg aaatggcccg cctggcatta tgcccagtag 660
atgacottat gggactttcc tacttggcag tacatctacg tattagtcac cgctattacc 720
atgggtgatgc ggttttggca gtacatcaat gggcgtggat accggtttga ctcacgcgga 780
tttccaagtc tccaccccat tgacgtcaat gggagtttgt tttggcacca aatcaacgg 840

gactttccaa aatgtcgtaa caactccgcc ccattgacgc aaatgggcgg taggcgtgta	900
cggtgggagg tctatataag cagagctggg tacgtgaacc gtcagatcgc ctggagacgc	960
catcacagat ctctcactat ggattttcag gtgcagatta tcagcttcct gctaatcagt	1020
gcttcagtca taatgtccag aggacaaatt gttctctccc agtctccagc aatcctgtct	1080
gcatctccag gggagaaggt cacaatgact tgcagggcca gctcaagtgt aagttacatc	1140
cactggttcc agcagaagcc aggatcctcc cccaaacctt ggatttatgc cacatccaac	1200
ctggctttctg gagtccctgt tcgcttcagt ggcagtgggt ctgggacttc ttactctctc	1260
acaatcagca gagtggaggc tgaagatgct gccacttatt actgccagca gtggactagt	1320
aaccacacca cgttcggagg ggggaccaag ctggaaatca aacgtacggt ggctgcacca	1380
tctgtcttca tcttcccgcc atctgatgag cagttgaaat ctggaactgc ctctgttgtg	1440
tgcttctga ataacttcta tcccagagag gccaaagtac agtggaaggt ggataacgcc	1500
ctccaatcgg gtaactccca ggagagtgtc acagagcagg acagcaagga cagcacctac	1560
agcctcagca gcacctgac gctgagcaaa gcagactacg agaaacacaa agtctacgcc	1620
tgcgaagtca cccatcaggc cctgagctcg cccgtcacia agagcttcaa caggggagag	1680
tggtgaattc agatccgtta acggttacca actacctaga ctggattcgt gacaacatgc	1740
ggccgtgata tctacgtatg atcagcctcg actgtgcctt ctagttgcca gccatctgtt	1800
gtttgcccct ccccggtgcc ttcttgacc ctggaagggt ccaactccac tgtcctttcc	1860
taataaaatg aggaaattgc atcgcattgt ctgagtaggt gtcattctat tctggggggt	1920
ggggtggggc aggacagcaa gggggaggat tgggaagaca atagcaggca tgctggggat	1980
gcggtgggct ctatggaacc agctggggct cgacagctat gccaaagtacg cccctattg	2040
acgtcaatga cggtaaattg cccgcctggc attatgcccc gtacatgacc ttatgggact	2100
ttctacttg gcagtacatc tacgtattag tcatcgctat taccatgggtg atgcggtttt	2160
ggcagtacat caatgggcgt ggatagcggg ttgactcacg gggatttcca agtctccacc	2220
ccattgacgt caatgggagt ttgttttggc accaaaatca acgggacttt ccaaaatgtc	2280
gtaacaactc cgccccattg acgcaaattg gcggtaggcg tgtacggtgg gaggtctata	2340
taagcagagc tgggtacgtc ctcacattca gtgatcagca ctgaacacag acccgctcagc	2400
atgggttgga gcctcatctt gctcttcctt gtcgctgttg ctacgcgtgt cctgtcccag	2460
gtacaactgc agcagcctgg ggctgagctg gtgaagcctg gggcctcagt gaagatgtcc	2520
tgcaaggctt ctggctacac atttaccagt tacaatatgc actgggtaaa acagacacct	2580
ggtcgggggc tggaatggat tggagctatt tatcccgga atgggtgatac ttctacaat	2640

cagaagttca aaggcaaggc cacattgact gcagacaaat cctccagcac agcctacatg	2700
cagctcagca gectgacatc tgaggactct gcggtctatt actgtgcaag atcgacttac	2760
tacggcggtg actggtactt caatgtcttg ggcgagggga ccacggtcac cgtctctgca	2820
gctagcacca agggcccatc ggtcttcccc ctggcaccct cctccaagag cacctctggg	2880
ggcacagcgg ccttgggctg cctggtcaag gactacttcc ccgaaccggt gacggtgtcg	2940
tggaaactcag ggcacctgac cagcggcgtg cacaccttcc cggctgtcct acagtccctca	3000
ggactctact cctcagcag cgtggtgacc gtgccctcca gcagcttggg caccagacc	3060
tacatctgca acgtgaatca caagcccagc aacaccaagg tggacaagaa agcagagccc	3120
aaatcttgtg aaaaaactca cacatgcca ccgtgccag cacctgaact cctgggggga	3180
ccgtcagtct tcctcttccc cccaaaacc aaggacacc tcattgatctc ccggaccct	3240
gaggtcacat gcgtggtggt ggacgtgagc caggaagacc ctgaggtcaa gttcaactgg	3300
tacgtggacg gcgtggaggt gcataatgcc aagacaaagc cgcgggagga gcagtacaac	3360
agcacgtacc gtgtggtcag cgtcctcacc gtctgcacc aggactggct gaatggcaag	3420
gagtacaagt gcaaggtctc caacaaagcc ctcccagccc ccattcgagaa aaccatctcc	3480
aaagccaaag ggcagccccg agaaccacag gtgtacaccc tgcccccatc ccgggatgag	3540
ctgaccaaga accagggtcag cctgacctgc ctggtcaaag gcttctatcc cagcgacatc	3600
gccgtggagt gggagagcaa tgggcagccg gagaacaact acaagaccac gcctcccgtg	3660
ctggactccg acggctcctt ctctctctac agcaagctca ccgtggacaa gagcaggtgg	3720
cagcagggga acgtcttctc atgctccgtg atgcatgagg ctctgcacaa ccactacacg	3780
cagaagagcc tctccctgtc tccgggtaaa tgaggatccg ttaacgggta ccaactacct	3840
agactggatt cgtgacaaca tgcggccgtg atatctacgt atgatcagcc tcgactgtgc	3900
cttctagttg ccagccatct gttgtttgcc cctccccgt gccttccttg accctggaag	3960
gtgccactcc cactgtcctt tcctaataaa atgaggaaat tgcattcgcat tgtctgagta	4020
ggtgtcattc tattctgggg ggtggggtgg ggcaggacag caagggggag gattgggaag	4080
acaatagcag gcatgctggg gatgcggtgg gctctatgga accagctggg gctcgacagc	4140
gctggatctc ccgatcccca gctttgcttc tcaatttctt atttgcataa tgagaaaaaa	4200
aggaaaatta attttaacac caattcagta gttgattgag caaatgcgtt gccaaaaagg	4260
atgctttaga gacagtgttc tctgcacaga taaggacaaa cattattcag agggagtacc	4320
cagagctgag actcctaagc cagtgagtgg cacagcattc tagggagaaa tatgcttgtc	4380
atcacccaag cctgattccg tagagccaca ccttggttaag ggccaatctg ctcacacagg	4440

atagagagggg	caggagccag	ggcagagcat	ataaggtgag	gtaggatcag	ttgctcctca	4500
catttgcttc	tgacatagtt	gtgttgggag	cttggatago	ttggacagct	cagggctgcg	4560
atttcgcgcc	aaacttgacg	gcaatcctag	cgtgaaggct	ggtaggattt	tatccccgct	4620
gccatcatgg	ttcgaccatt	gaactgcac	gtcgccgtgt	cccaaaatat	ggggattggc	4680
aagaacggag	acctaccctg	gcctccgctc	aggaacgagt	tcaagtactt	ccaaagaatg	4740
accacaacct	cttcagtgga	aggtaaacag	aatctggtga	ttatgggtag	gaaaacctgg	4800
ttctccattc	ctgagaagaa	tcgaccttta	aaggacagaa	ttaatatagt	tctcagtaga	4860
gaactcaaag	aaccaccacg	aggagctcat	tttcttgcca	aaagtttgga	tgatgcctta	4920
agacttattg	aacaaccgga	attggcaagt	aaagtagaca	tggtttggat	agtcggaggc	4980
agttctgttt	accaggaagc	catgaatcaa	ccaggccacc	ttagactctt	tgtgacaagg	5040
atcatgcagg	aatttgaaag	tgacacgttt	ttcccagaaa	ttgatttggg	gaaatataaa	5100
cttctcccag	aatacccagg	cgctcctctc	gaggtccagg	aggaaaaagg	catcaagtat	5160
aagtttgaag	tctacgagaa	gaaagactaa	caggaagatg	ctttcaagtt	ctctgctccc	5220
ctcctaaagc	tatgcatttt	tataagacca	tgggactttt	gctggcttta	gatcagcctc	5280
gactgtgcct	tctagttgcc	agccatctgt	tgtttgcccc	tccccgtgc	cttccttgac	5340
cctggaaggt	gccactccca	ctgtcctttc	ctaataaaat	gaggaaattg	catcgcattg	5400
tctgagtagg	tgtcattcta	ttctgggggg	tggggtgggg	caggacagca	agggggagga	5460
ttgggaagac	aatagcaggc	atgctgggga	tgcggtgggc	tctatggaac	cagctggggc	5520
tcgagctact	agctttgctt	ctcaatttct	tatttgcata	atgagaaaaa	aaggaaaatt	5580
aattttaaca	ccaattcagt	agttgattga	gcaaatgcgt	tgccaaaaag	gatgctttag	5640
agacagtgtt	ctctgcacag	ataaggacaa	acattattca	gagggagtac	ccagagctga	5700
gactcctaag	ccagtgagtg	gcacagcatt	ctagggagaa	atatgcttgt	catcaccgaa	5760
gcctgattcc	gtagagccac	accttggtaa	gggccaatct	gctcacacag	gatagagagg	5820
gcaggagcca	gggcagagca	tataaggtga	ggtaggatca	gttgctcctc	acatttgctt	5880
ctgacatagt	tgtgttggga	gcttggatcg	atcctctatg	gttgaacaag	atggattgca	5940
cgcaggttct	ccggccgctt	gggtggagag	gctattcggc	tatgactggg	cacaacagac	6000
aatcggtgc	tctgatgccg	ccgtgttccg	gctgtcagcg	caggggcgcc	cggttctttt	6060
tgtcaagacc	gacctgtccg	gtgccctgaa	tgaactgcag	gacgaggcag	cgcggtatc	6120
gtggctggcc	acgacgggcg	ttccttgccg	agctgtgctc	gacgttgtca	ctgaagcggg	6180
aagggactgg	ctgctattgg	gcgaagtgcc	ggggcaggat	ctcctgtcat	ctcaccttgc	6240

tccctgccgag aaagtatcca tcatggctga tgcaatgcgg cggctgcata cgcttgatcc	6300
ggctacctgc ccattcgacc accaagcgaa acatcgcatc gagcgagcac gtactcggat	6360
ggaagccggt cttgtcgatc aggatgatct ggacgaagag catcaggggc tcgcccagc	6420
cgaactgttc gccaggctca aggcgcgcac gcccgacggc gaggatctcg tcgtgacca	6480
tggcgatgcc tgcttgccga atatcatggg ggaaaatggc cgcttttctg gattcatcga	6540
ctgtggccgg ctgggtgtgg cggaccgcta tcaggacata gcgttggcta cccgtgatat	6600
tgctgaagag cttggcggcg aatgggctga ccgcttctc gtgctttacg gtatcgccgc	6660
tcccgattcg cagcgcacgc ccttctatcg ccttcttgac gagttcttct gagcgggact	6720
ctgggggttcg aaatgaccga ccaagcgacg cccaacctgc catcacgaga tttcgattcc	6780
accgcgcct tctatgaaag gttgggcttc ggaatcgttt tccgggacgc cggctggatg	6840
atcctccagc gcggggatct catgctggag ttcttcgccc accccaactt gtttattgca	6900
gcttataatg gttacaaata aagcaatagc atcacaatt tcacaaataa agcatttttt	6960
tcaactgcatt ctagttgtgg tttgtccaaa ctcatcaatc tatcttatca tgtctggatc	7020
gcggccgcga tcccgtcgag agcttggcgt aatcatggtc atagctgttt cctgtgtgaa	7080
attgttatcc gctcacaatt ccacacaaca tacgagccgg aagcataaag tgtaaagcct	7140
ggggtgccta atgagtgagc taactcacat taattgcgtt gcgctcactg cccgctttcc	7200
agtcgggaaa cctgtcgtgc cagctgcatt aatgaatcgg ccaacgcgcg gggagaggcg	7260
gtttgcgtat tgggcgctct tccgcttctc cgctcactga ctgctgcgc tcggtcgttc	7320
ggctgcggcg agcggatatc gctcactcaa aggcggtaat acggttatcc acagaatcag	7380
gggataacgc aggaaagaac atgtgagcaa aaggccagca aaaggccagg aaccgtaaaa	7440
aggccgcgtt gctggcgttt ttccataggc tccgcccccc tgacgagcat cacaaaaatc	7500
gacgctcaag tcagaggtgg cgaaaccgca caggactata aagataccag gcgtttcccc	7560
ctggaagctc cctcgtgcgc tctcctgttc cgacctgcc gcttaccgga tacctgtccg	7620
cctttctccc ttcgggaagc gtggcgcttt ctcaatgctc acgctgtagg tatctcagtt	7680
cgggtgtaggt cgttcgctcc aagctgggct gtgtgcacga acccccgtt cagcccagcc	7740
gotgcgcctt atccggtaac tatcgtcttg agtccaaacc ggtaagacac gacttatcgc	7800
cactggcagc agccactggt aacaggatta gcagagcgag gtatgtaggc ggtgctacag	7860
agttcttgaa gtgggtggcct aactacggt acactagaag gacagtattt ggtatctgcg	7920
ctctgctgaa gccagttacc ttcggaaaaa gagttggtag ctcttgatcc ggcaaaaaa	7980
ccaccgctgg tagcgggtgt ttttttgttt gcaagcagca gattacgcgc agaaaaaaag	8040

```

gatctcaaga agatcctttg atcttttcta cgggggtctga cgctcagtgg aacgaaaact 8100
cacgttaagg gatttttggtc atgagattat caaaaaggat cttcacctag atccttttaa 8160
attaaaaatg aagtttttaa tcaatctaaa gtatatatga gtaaacttgg tctgacagtt 8220
accaatgctt aatcagtgag gcacctatct cagcgatctg tctatttcgt tcatccatag 8280
ttgcctgact ccccgctcgtg tagataacta cgatacggga gggcttacca tctggcccca 8340
gtgctgcaat gataccgcga gaccacgct caccggctcc agatttatca gcaataaacc 8400
agccagccgg aagggccgag cgcagaagtg gtcttgcaac tttatccgcc tccatccagt 8460
ctattaattg ttgccgggaa gctagagtaa gtagttcgcc agttaatagt ttgcgcaacg 8520
ttgttgccat tgctacaggc atcgtggtgt cagcctcgtc gtttggtatg gcttcattca 8580
gctccggttc ccaacgatca aggcgagtta catgatcccc catgttggtgc aaaaaagcgg 8640
ttagctcctt cggctcctcg atcgttggtc gaagtaagtt ggccgcagtg ttatcactca 8700
tggttatggc agcactgcat aattctctta ctgtcatgcc atccgtaaga tgcttttctg 8760
tgactggtga gtactcaacc aagtcattct gagaatagtg tatgcggcga ccgagttgct 8820
cttgcccggc gtcaatacgg gataataccg cgccacatag cagaacttta aaagtgtca 8880
tcattggaaa acgttcttcg gggcgaaaac tctcaaggat cttaccgctg ttgagatcca 8940
gttcgatgta acccactcgt gcacccaact gatcttcagc atcttttact ttcaccagcg 9000
tttctgggtg agcaaaaaca ggaaggcaaa atgccgcaaa aaaggaata agggcgacac 9060
ggaaatgttg aatactcata ctcttccttt ttcaatatta ttgaagcatt tatcagggtt 9120
attgtctcat gagcggatac atatttgaat gtatttagaa aaataaacia ataggggttc 9180
cgcgcacatt tccccgaaaa gtgccacct 9209

```

<210> 3
 <211> 384
 <212> DNA
 <213> Mus musculus

<400> 3

```

atggattttc aggtgcagat tatcagcttc ctgctaataca gtgcttcagt cataatgtcc 60
agagggcaaa ttgttctctc ccagtctcca gcaatcctgt ctgcatctcc aggggagaag 120
gtcacaatga cttgcagggc cagcctgtct gcctctccag gggagaaggt cacaatgact 180
tgccagggcca gccccaaacc ctggatttat gccacatcca acctggcttc tggagtcctt 240
gttcgcttca gtggcagtgg gtctgggact tcttactctc tcacaatcag cagagtggag 300
gctgaagatg ctgccactta ttactgccag cagtggacta gtaaccacc caggttcgga 360

```

ggggggacca agctggaaat caaa

384

<210> 4
 <211> 128
 <212> PRT
 <213> Mus musculus

<400> 4

Met Asp Phe Gln Val Gln Ile Ile Ser Phe Leu Leu Ile Ser Ala Ser
 1 5 10 15

Val Ile Met Ser Arg Gly Gln Ile Val Leu Ser Gln Ser Pro Ala Ile
 20 25 30

Leu Ser Ala Ser Pro Gly Glu Lys Val Thr Met Thr Cys Arg Ala Ser
 35 40 45

Ser Ser Val Ser Tyr Ile His Trp Phe Gln Gln Lys Pro Gly Ser Ser
 50 55 60

Pro Lys Pro Trp Ile Tyr Ala Thr Ser Asn Leu Ala Ser Gly Val Pro
 65 70 75 80

Val Arg Phe Ser Gly Ser Gly Ser Gly Thr Ser Tyr Ser Leu Thr Ile
 85 90 95

Ser Arg Val Glu Ala Glu Asp Ala Ala Thr Tyr Tyr Cys Gln Gln Trp
 100 105 110

Thr Ser Asn Pro Pro Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
 115 120 125

<210> 5
 <211> 420
 <212> DNA
 <213> Mus musculus

<400> 5

atgggttgga gcctcatctt gctcttcctt gtcgctggtg ctacgcgtgt cctgtcccag 60
 gtacaactgc agcagcctgg ggctgagctg gtgaagcctg gggcctcagt gaagatgtcc 120
 tgcaaggctt ctggctacac atttaccagt tacaatatgc actgggtaaa acagacacct 180
 ggtcggggcc tggaatggat tggagctatt tatcccgga atggtgatac ttcctacaat 240
 cagaagttca aaggcaaggc cacattgact gcagacaaat cctccagcac agcctacatg 300
 cagctcagca gcctgacatc tgaggactct gcggtctatt actgtgcaag atcgacttac 360

tacggcggtg actggtactt caatgtctgg ggcgcagggg ccacggtcac cgtctctgca 420

<210> 6
 <211> 140
 <212> PRT
 <213> Mus musculus

<400> 6

Met Gly Trp Ser Leu Ile Leu Leu Phe Leu Val Ala Val Ala Thr Arg
 1 5 10 15

Val Leu Ser Gln Val Gln Leu Gln Gln Pro Gly Ala Glu Leu Val Lys
 20 25 30

Ala Gly Ala Ser Val Lys Met Ser Cys Lys Ala Ser Gly Tyr Thr Phe
 35 40 45

Thr Ser Tyr Asn Met His Trp Val Lys Gln Thr Pro Gly Arg Gly Leu
 50 55 60

Glu Trp Ile Gly Ala Ile Tyr Pro Gly Asn Gly Asp Thr Ser Tyr Asn
 65 70 75 80

Gln Lys Phe Lys Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser
 85 90 95

Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val
 100 105 110

Tyr Tyr Cys Ala Arg Ser Thr Tyr Tyr Gly Gly Asp Trp Tyr Phe Asn
 115 120 125

Val Trp Gly Ala Gly Thr Thr Val Thr Val Ser Ala
 130 135 140

<210> 7
 <211> 27
 <212> DNA
 <213> Artificial

<220>
 <223> impaired Kozak sequence and restriction enzyme site

<400> 7

gggagcttgg atcgatcctc tatggtt 27

<210> 8
<211> 47
<212> DNA
<213> Artificial

<220>
<223> PCR Primer

<400> 8

atcacagatc tctcaccatg gattttcagg tgcagattat cagcttc

47

<210> 9
<211> 30
<212> DNA
<213> Artificial

<220>
<223> PCR Primer

<400> 9

tgcagcatcc gtacgtttga tttccagctt

30

<210> 10
<211> 27
<212> DNA
<213> Artificial

<220>
<223> PCR Primer

<400> 10

gcggctccca cgcgtgtcct gtcccag

27

<210> 11
<211> 29
<212> DNA
<213> Artificial

<220>
<223> PCR Primer

<220>
<221> misc_feature
<222> (1)..(29)
<223> s is g or c

<220>
<221> misc_feature
<222> (1)..(29)
<223> m is a or c

<220>
<221> misc_feature
<222> (1)..(29)

<223> r is g or a

<400> 11

ggstgttgtagctgmrg agacrgtga

29